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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,835	05/01/2001	Steven Danyluk	GTRC69	4975
27433	7590	09/15/2005	EXAMINER	
FOLEY & LARDNER 321 NORTH CLARK STREET SUITE 2800 CHICAGO, IL 60610-4764			LARKIN, DANIEL SEAN	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 09/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/846,835	Applicant(s) DANYLUK ET AL. (signature)	
	Examiner Daniel S. Larkin	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 11, 14, 15, 23, 25, and 27 are objected to because of the following informalities:

Re claims 11, 14, 15, 23, 25, and 27, claim line 1: The term "Claim" should be corrected to read -- claim -- in order to maintain consistency with the presentation of original claims 1-10. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 13-15 and 24-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With respect to the limitations of claims 13, 24, 26, and 28, the specification fails to provide an enabling description for using a non-contact detector for measuring the chemical properties of a component/sample. The specification only discusses surface conditions or surface variations, such as surface wear.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-10, 13-23, 26, and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1: The preamble recites an apparatus for “monitoring surface variations on a component”; however, the body of the claim provides no connection between measuring contact potential difference between the probe and component and equating the contact potential difference to surface variations on the component.

Re claim 8: The preamble recites a process for “monitoring surface variations on a component”; however, the body of the claim provides no connection between monitoring the contact potential difference between the probe and component and equating the contact potential difference to surface variations on the component.

Re claim 13: The preamble recites a detector for “measuring at least one of chemical properties and tribological wear of a component”; however, the body of the claim provides no connection between measuring a temporal variation in a property relatable to the component work function and equating the temporal variation with a chemical property or tribological wear.

Re claim 16: The preamble recites an apparatus for “monitoring surface changes on a component”; however the body of the claim provides no connection between measuring a property which is relatable to the contact potential difference

Art Unit: 2856

between the component and a probe and equating the contact potential difference to surface changes on the component.

Re claim 22: The preamble recites a capacitance probe for "measuring at least one property of a sample"; however, the body of the claim provides no connection between measuring current induced by activating a voltage source in an electrical circuit and equating this step to a measurement of a sample property.

Re claim 26: The preamble recites a method of "sensing at least one of chemical properties and tribological wear of a sample"; however, the body of the claim provides no connection between measuring a current related to a contact potential difference between the sample and a sensor and equating the contact potential difference with a chemical property or tribological wear.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by US 5,369,370 (Stratmann et al.).

With respect to the limitations of claim 11, the reference to Stratmann et al. discloses an apparatus for the measurement of the corrosion potential between a coated metal surface and a reference electrode, comprising: a sensor/reference

Art Unit: 2856

electrode (14) being in electrical communication with a sample (16), the sample (16) and the reference electrode (14) having different work functions, see col. 6, lines 52-57 and claim 2, and being separated from one another by a characteristic distance, see col. 2, line 26 and 27, and a measurement device for measuring a current related to a contact potential difference between the sample and the reference electrode, thereby measuring a property, i.e. corrosion potential, of the sample.

8. Claims 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4,973,910 (Wilson).

With respect to the limitations of claim 11, the reference to Wilson discloses in the background of the invention section that the a variety of methods are available to measure the work function of a sample, whereby a contact potential difference is measured between a surface of interest and a second, non-contacting reference surface or probe. The contact potential difference is equal to the difference in the work functions of two metals surfaces electrically connected.

With respect to the limitation of claim 12, the reference to Wilson discloses that his specific invention utilizes a non-vibrating sensor.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,973,910 (Wilson).

With respect to the limitations of claim 13, the reference to Wilson discloses in the background of the invention section that the a variety of methods are available to measure the work function of a sample, whereby a contact potential difference is measured between a surface of interest, having a work function, and a non-contacting reference surface or probe, also having a work function. The contact potential difference is equal to the difference in the work functions of two metals surfaces electrically connected. Movement of the probe or non-contacting reference surface with respect to the surface of interest will create a temporal variation in the contact potential difference, which is relatable to the work function of the surface of interest.

11. Claims 11-15, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,136,247 (Hansen).

With respect to the limitations of claim 11, the reference to Hansen disclose an apparatus for measuring a property of a sample, comprising a sensor (32, 34) being in electrical communication with a sample and being separate from one another by a characteristic distance, and a measurement device (30) for measuring a current related to a contact potential difference between the probe and the surface of the sample, col. 6, lines 49-52. The reference discloses that contact potential difference and the work function will vary if contaminant or coatings are present. Such variations can be used to

determine cleanliness of a surface, the uniformity of thickness of a coating, and other information about the condition of the surface, col. 1, lines 16-21. As to the limitation that the sensor and the component have different work functions, the reference to Hansen appears to suggest this feature, col. 4, lines 64-66.

With respect to the limitation of claim 12, the reference to Hansen fails to expressly recite a non-vibrating capacitance probe; however, the reference does disclose that any probe useful to measure contact potential difference between a conductive probe and a conductive material may be used.

With respect to the limitations of claim 13, the reference to Hansen disclose an apparatus and method for calibrated work function measurements, whereby a sensor/probe (32, 34) having a work function is located in proximity to a component/sample (40) also having a work function, as shown in Figure 3. The reference further discloses a detection means (30) that is used to measure a contact potential difference between the probe and the surface of the sample, col. 6, lines 49-52. The reference discloses that the work function will vary if contaminant or coatings are present. Such variations can be used to determine cleanliness of a surface, the uniformity of thickness of a coating, and other information about the condition of the surface, col. 1, lines 16-21.

With respect to the limitation of claim 14, the reference appears to suggest that the probe and the sample have different work functions, col. 4, lines 64-66.

With respect to the limitations of claim 15, the reference to Hansen discloses that the induced current is measured; however, a voltage is applied to nullify the detected

current flow. The voltage required to nullify the current flow is reflective of the contact potential difference between the probe and the surface

With respect to the limitations of claim 22, the reference to Hansen discloses a capacitance sensor for measuring a property of a sample, comprising: a reference/probe electrode and a sample forming a capacitance circuit, the probe electrode positioned just above the sample and maintained in a spaced relationship with respect to the sample/component, the sample and the reference electrode/probe forming a capacitor element of the electrical circuit. Additionally, a voltage source (35) is coupled to the reference electrode/probe and being a part of the electrical circuit. Lastly, the reference teaches a device for measuring current induced by activating the voltage source in the electrical circuit. The reference discloses that the voltage source is used to nullify the current flow.

With respect to the limitation of claim 23, the reference to Hansen discloses that any probe useful to measure contact potential difference between a conductive probe and a conductive material may be used.

12. Claims 1, 5, 7, 16, 20, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,136,247 (Hansen) in view of US 5,369,370 (Stratmann et al.).

With respect to the limitations of claim 1, the reference to Hansen discloses an apparatus for monitoring surface variations on a component/sample, comprising a non-vibrating capacitance probe (any probe can be used, col. 6, lines 48-51); and means (30) for measuring a property which is related to the contact potential difference

Art Unit: 2856

between the component/sample (40) and the probe. The reference to Hansen discloses that the work function will vary if contaminant or coatings are present. Such variations can be used to determine cleanliness of a surface, the uniformity of thickness of a coating, and other information about the condition of the surface, col. 1, lines 16-21. The reference to Hansen further discloses positioning the probe with respect to the sample; however, the reference fails to expressly disclose a structural means for positioning the probe with respect to the component/sample.

The reference to Stratmann et al. discloses a Kelvin probe for measuring the contact potential difference between a probe and a corrodible surface. The probe is provided with placement means in the form of a micrometer screw (17). Modifying the invention of Hansen to provide a placement device would have been obvious to one of ordinary skill in the art as means of more accurately positioning the probe with respect to the sample than can be achieved by a human operator.

With respect to the limitation of claim 5, the references to Hansen and Stratmann et al. both show a sample/component; however, neither reference expressly shows support of the sample. It is the examiner's position that a sample support means is inherent within the teaching of both references in order to hold the sample in position. In neither patent is it reasonable to think that the sample being testing is levitating.

With respect to the limitation of claim 7, the reference to Hansen discloses that contact potential difference measurement are utilized to measure surface conditions of a sample, such as uniformity of coating thickness, which may be indicative of wear.

With respect to the limitations of claim 16, the reference to Hansen discloses an

apparatus for monitoring surface changes on a component/sample, comprising a non-vibrating capacitance probe (any probe can be used, col. 6, lines 48-51); and a measurement device (30) for measuring a property, which is related to the contact potential difference between the component/sample (40) and the probe. The reference to Hansen discloses that the work function will vary if contaminant or coatings are present. Such variations can be used to determine cleanliness of a surface, the uniformity of thickness of a coating, and other information about the condition of the surface, col. 1, lines 16-21. The reference to Hansen further discloses positioning the probe with respect to the sample; however, the reference fails to expressly disclose a placement device for positioning the probe with respect to the component/sample.

The reference to Stratmann et al. discloses a Kelvin probe for measuring the contact potential different between a probe and a corrodible surface. The probe is provided with placement means in the form of a micrometer screw (17). Modifying the invention of Hansen to provide a placement device would have been obvious to one of ordinary skill in the art as means of more accurately positioning the probe with respect to the sample than can be achieved by a human operator.

With respect to the limitation of claim 20, the references to Hansen and Stratmann et al. both show a sample/component; however, neither reference expressly shows support of the sample. It is the examiner's position that a sample support means is inherent within the teaching of both references in order to hold the sample in position. In neither patent is it reasonable to think that the sample being testing is levitating.

With respect to the limitations of claim 26, the reference to Hansen discloses a

Art Unit: 2856

method for measuring surface changes of a sample, comprising: positioning a non-vibrating capacitance probe (any probe can be used, col. 6, lines 48-51) in proximity to a sample, the probe being separated by a selected distance from the sample; and a measuring a current related to a contact potential difference between the sample and the sensor/probe. The reference to Hansen discloses that the work function will vary if contaminant or coatings are present. Such variations can be used to determine cleanliness of a surface, the uniformity of thickness of a coating, and other information about the condition of the surface, col. 1, lines 16-21. The reference to Hansen fails to expressly recite measuring chemical properties of the sample.

The reference to Stratmann et al. discloses a Kelvin probe for measuring the contact potential different between a probe and a corrodible surface. Utilizing the probe to measuring chemical changes of a sample would have been obvious to one of ordinary skill in the art because Kelvin type probes having the ability to monitor corrosion potentials underneath coatings with high spatial resolution as well as quickly and reproducibly.

With respect to the limitations of claim 28, the reference to Hansen discloses a method for measuring surface changes of a sample, comprising: locating a non-vibrating sensor (any probe can be used, col. 6, lines 48-51) having a sensor work function in proximity to a sample having a sample work function, the probe being separated by a selected distance from the sample; measuring an induced current between the sample and the sensor; and determining at least one property of the sample by relating the induced current to a difference between the sensor work function

Art Unit: 2856

and the sample work function. The reference discloses that the voltage source is used to nullify the current flow and the voltage is representative of the contact potential difference between the sensor and the sample. The reference to Hansen discloses that the work function will vary if contaminant or coatings are present. Such variations can be used to determine cleanliness of a surface, the uniformity of thickness of a coating, and other information about the condition of the surface, col. 1, lines 16-21. The reference to Hansen fails to expressly recite measuring chemical properties of the sample.

The reference to Stratmann et al. discloses a Kelvin probe for measuring the contact potential difference between a probe and a corrodible surface. Utilizing the probe to measuring chemical changes of a sample would have been obvious to one of ordinary skill in the art because Kelvin type probes having the ability to monitor corrosion potentials underneath coatings with high spatial resolution as well as quickly and reproducibly.

Allowable Subject Matter

13. The following is a statement of reasons for the indication of allowable subject matter:

Prior art was not relied upon to reject claims 2-4, 6, 8-10, 17-19, 21, 24, 26, and 27 because the prior art fails to teach and/or make obvious the following:

Claims 2 and 3: Providing a means for measuring the relative motion between a component and a non-vibrating capacitance probe in combination with all of the limitations of the base claim.

Claim 4: Providing a means for measuring the special distance between a component and a non-vibrating capacitance probe in combination with all of the limitations of the base claim.

Claim 6: Providing means for positioning a non-vibrating capacitance probe in proximity to a component which is fixed relative to means for supporting the component in combination with all of the limitations of the base claim.

Claims 8-10: Providing a method for monitoring surface variations on a component, comprising the following steps: imparting relative motion between the component and a non-vibrating capacitance probe; and monitoring the contact potential difference between the component and the non-vibrating capacitance probe in combination with all of the remaining limitations of the claim.

Claims 17 and 18: Providing a means for measuring the relative motion between a component and a non-vibrating capacitance probe in combination with all of the limitations of the base claim.

Claim 19: Providing a third measurement device for measuring a nearest spatial distance between a component and a non-vibrating capacitance probe in combination with all of the limitations of the base claim.

Claim 21: Providing a placement device for positioning a non-vibrating capacitance probe in proximity to a component that is fixed relative to a support for the component in combination with all of the limitations of the base claim.

Claims 24 and 25: Providing a non-contact detector for measuring at least one of chemical properties and tribological wear of a sample, comprising: a non-vibrating sensor being in electrical communication with a sample; and a measurement device for measuring a current related to a time varying change in a selected distance of closest approach between the sample and the sensor, thereby measuring the at least one of tribological wear and chemical changes of the sample in combination with all of the remaining limitations of the claim.


Claim 27: Providing a method of sensing at least one of chemical properties and tribological wear of a sample, comprising the steps of: imparting relative motions between a sample and a non-vibrating sensor in proximity to the sample; and measuring a current related to a contact potential difference between the sample and the sensor in combination with all of the remaining limitations of the base claim.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Larkin whose telephone number is 571-272-2198. The examiner can normally be reached on 8:00 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Larkin
AU 2856
08 September 2005



DANIEL S. LARKIN
PRIMARY EXAMINER